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SNOW SURVEYS AND IRRIGATION WATER FORECASTS

for the

MISSOURI and ARKANSAS

DRAINAGE BASINS

May 1, 1941



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Issued by the
United States Department of Agriculture
Soil Conservation Service
Division of Irrigation
In Cooperation with
The Colorado Agricultural Experiment Station
Colorado State College
Fort Collins, Colorado

May 10, 1941

SNOW SURVEYS AND IRRIGATION WATER FORECASTS
FOR MISSOURI AND ARKANSAS RIVERS

May 1, 1941

The following data pertaining to snow surveys and irrigation water-supply forecasts are provided by the Division of Irrigation, Soil Conservation Service, of the U. S. Department of Agriculture, in cooperation with State departments, other Federal bureaus and local organizations. The snow measurements are made principally by field personnel of the following organizations: Forest Service, National Park Service, Bureau of Reclamation, U. S. Geological Survey, War Department and State Experiment Stations. This work is otherwise conducted cooperatively with the State Engineers of Colorado and Wyoming, and various municipalities, irrigation associations, power companies and others. Precipitation records are supplied by the U. S. Weather Bureau.

PRECIPITATION DATA

WATERSHED	STATE	Precipitation October 1 to April 30	Departure from Normal	Precipitation		Departure from Normal
				Inches	Inches	
Missouri	East. Mont.	5.08	-0.24	1.64	+.54	
Missouri	Cent. Mont.	5.08	-0.72	1.76	+.56	
Missouri	North. Wyo.	9.50	-0.25	3.13	+1.16	
North Platte	Wyoming	7.89	+0.99	3.10	+1.68	
South Platte	Colorado	8.78	-0.50	3.00	+0.36	
Arkansas	Colorado	7.78	+1.72	2.68	+1.12	

Precipitation on the watershed of the Missouri in Montana, the Yellowstone and North Platte in Wyoming and the South Platte and the Arkansas in Colorado was above normal during April. The greatest excess of precipitation occurred over the watersheds of the Yellowstone, North Platte and Arkansas Rivers. The accumulated precipitation from October 1 to April 30 is now slightly above normal except in central Montana, northern Wyoming and northern Colorado. Conditions generally are much better than they were a month ago.

SUMMARY OF MAY 1 SNOW SURVEYS AND COMPARISON OF DATA

WITH THAT OF PREVIOUS YEARS BY WATERSHEDS

WATERSHEDS	Snow Depth						Water Content			1941 Water Content in percent of 1940					
	Six Year Avg.*	In.	In.	In.	In.	In.	Six Year Avg.*	In.	In.	Six Year Avg.*	In.	In.	Six Year Avg.*	In.	Six Year Avg.*
	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
MISSOURI RIVER															
Jefferson River	24.6	26.6	22.9	9.0	10.2	7.6	3	37	38	33	84	74	77	82	74
Madison River	31.2	29.4	25.4	13.3	12.6	10.3	5	43	43	41	41	66	55	55	55
Gallatin River	22.3	25.4	16.5	8.2	9.9	5.4	4	37	39	33	32	78	58	58	58
Missouri River**	12.2	14.5	9.8	4.0	5.3	3.1	5	33	37	44	44	—	—	—	—
Marias River	15.1	16.4	0.0	6.8	7.3	0.0	2	45	44	44	44	32	112	103	103
Yellowstone River	26.3	24.2	34.0	9.8	10.7	11.0	2	37	44	37	32	27	80	79	79
Shoshone River	36.9	34.1	37.8	12.6	12.7	10.1	3	34	37	41	41	32	117	139	139
Bighorn River	26.7	19.3	34.7	9.4	7.9	11.0	8	35	41	47	47	33	125	106	106
Tongue River	20.4	20.2	30.4	8.0	9.4	10.0	2	39	47	33	33	187	200	200	200
Powder River	16.4	15.0	26.2	4.6	4.3	8.6	2	28	28	29	29	33	37	100	115
North Platte River	45.0	41.6	49.2	18.2	15.8	18.2	11	40	38	37	37	33	142	212	212
Sweetwater River	32.6	19.8	48.8	10.8	7.2	15.3	2	33	36	31	31	33	101	131	131
Laramie River	29.3	22.0	33.5	10.9	8.4	11.0	9	37	38	38	38	33	—	—	—
South Platte River***	12.8	10.2	22.0	4.0	2.5	6.4	3	31	25	29	29	29	160	256	256
Crow Creek	2.8	0.0	8.6	0.9	0.0	2.6	1	32	—	30	30	289	—	—	—
Poudre River	34.3	28.3	35.0	12.5	10.0	11.7	7	36	35	33	33	94	117	117	117
Big Thompson River	66.2	61.8	67.4	24.7	20.5	23.5	1	37	33	35	35	95	115	115	115
St. Vrain River	33.5	25.2	37.2	12.3	10.2	12.4	1	37	40	33	33	101	121	121	121
Boulder Creek	27.0	24.2	28.8	9.8	8.8	9.6	2	36	36	34	34	33	98	109	109
Clear Creek	37.9	19.9	42.5	13.0	8.9	12.7	1	34	45	30	30	98	143	143	143
ARKANSAS RIVER	22.0	16.3	38.9	7.7	4.7	13.2	7	35	29	34	34	34	171	281	281

*Some for shorter periods. **Headwaters of Missouri River. ***Above Denver, Colo.

WATER SUPPLY OUTLOOK

MONTANA. Snow conditions over the headwaters of the Missouri and tributaries have not been improved generally during April. The May 1 snow surveys indicate the water content to be about 60 percent of that of a year ago and approximately 75 percent of the past 6-year average. The outlook appears to be rather discouraging for an adequate run-off this coming season. Streamflow is slightly above normal at this time. Reservoir storage, May 1, is about 90 percent as compared with 1940 and 70 percent of that of 1939. Soil moisture conditions are reported as favorable at present, comparable to that of a year ago, particularly in the eastern part of the state.

WYOMING. The snow cover generally over the northern part of the state has improved during April, especially for the Big Horn drainage, where the water content of the snow increased 4.2 inches to a total of 11.0 inches. For the North Platte and Laramie watersheds, April snows added 4.3 inches to the former and 2.5 inches to the latter for total water contents of 18.2 inches and 11.0 inches respectively, for these two basins. Because of the increase in water content of the snow on the headwaters of these streams during April the outlook now is much improved with an estimated run-off of about 80 percent of the April-July average for the past 6 years. For the Tongue, Powder and Sweetwater the outlook for a favorable run-off has also improved during the past month. April storms added 6 inches to the water content of the snow on the Tongue, 4.2 inches for the Powder and 6.2 inches on the Sweetwater. The May 1 snow surveys show about 2 inches less water in the snow on the Shoshone drainage than for April 1. Conditions on the Yellowstone have not improved during the month of April. Reservoir storage in the North Platte Valley in Wyoming was 315,000 acre-feet on May 1 as compared with 284,000 last year at this time. The Wheatland Reservoirs now store 17,700 acre-feet as compared with 10,900 a year ago. Storage on the Wind River, Bull Lake and Pilot Butte, May 1, was 37,400 acre-feet, May 1, 1940 it was 63,500. Present soil moisture conditions over the state are good to excellent.

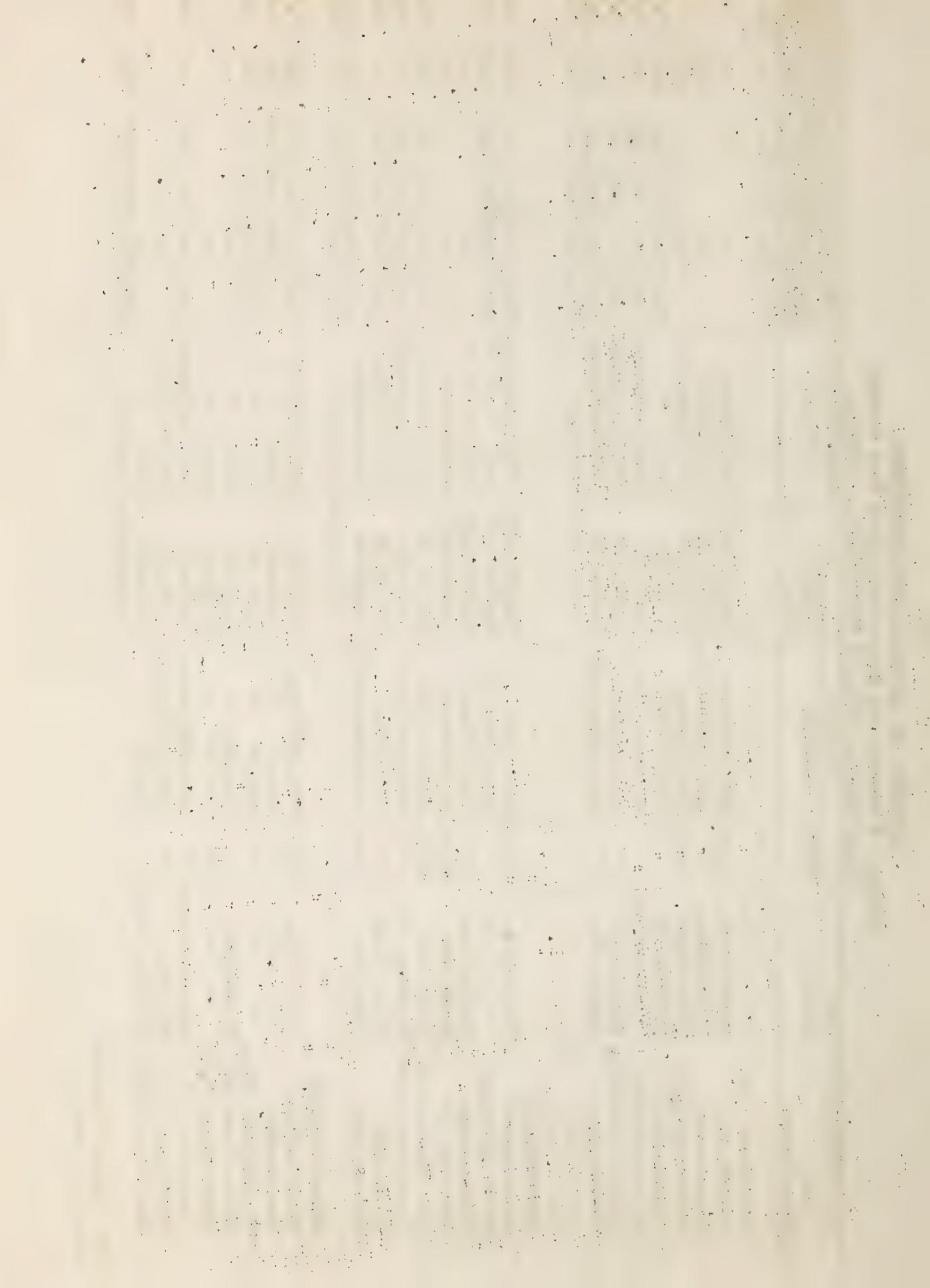
COLORADO. For the South Platte River above Denver, the water content of the snow is more than twice that of a year ago. Snow on Hoosier Pass accumulated 2 inches of water during the past month. Considerable increase occurred in the water content of the snow during April on the headwaters of the tributaries to the South Platte. The increase for the Poudre was 3.1 inches; St. Vrain, 4.8 inches; Boulder 1.0; and Clear Creek 2.8. The run-off for this section of northern Colorado is now expected to be above normal with sufficient water to fill many of the storage reservoirs. Because of the excellent soil moisture, direct irrigation will be deferred, thus permitting a large proportion of the early run-off to be put in storage. Water levels in pumping areas are about the same as last year except in Larimer and Weld counties where they are generally lower.

The outlook for the Arkansas Valley has improved since April 1. Ten snow courses surveyed May 1 show an average increase in the water content of 1.6 inches. On Monarch Pass the April accumulation of water was 5.1 inches, and a similar gain was found on the headwaters of the Purgatoire. The best gain for the past month, amounting to 5.6 inches, was found at Blue Lakes, on the headwaters of Uchara Creek. The maximum water content of the snow, May 1, on the Arkansas drainage was 24.5 inches at Monarch Pass snow course. The April-July run-off at Salida is expected to be about 275,000 acre-feet. Reservoir storage in the Arkansas Valley is nil at this time. Twin Lakes at Leadville is only 20 percent filled. Soil moisture in the valley is good.

MISSOURI AND ARKANSAS RIVER WATERSHEDS
Summary of Federal and State Cooperative Snow Surveys
Issued May 10, 1941, at Fort Collins, Colorado

Main Drainage and Snow Course No.	Local Drainage	State	Locality	Description	Elev. National Forest						May 1 Snow Course Measurements					
					1940		1941		Avg.		Av. Snow Depth		Av. Water Content		1940	
					In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
JEFFERSON RIVER																
6 Camp Creek*	Red Rock Cr.	Idaho	6mi.N.Spencer	21-13N-36E	6800	Targhee	---	---	46.2	40.0	48.8	19.6	18.2	18.6		
7 Moose Creek*	N.Fk.Bighole	"	3mi.S.Gibbons P.	27-27N-21E	6200	Salmon	12.0	4.7								
7 East Fork R.S.*	Rock Creek	Mont.	13mi.N.E.Sula	16-2N-17W	5400	Bitterroot	0.0	0.0								
10 Gibbons Pass	N.Fk.Bighole	"	Gibbons Pass	4-2S-19W	7100	"	35.0	26.5	16.1	14.4	11.4					
30 Pipestone Pass	Pipestone Cr.	"	Pipestone Pass	11-1N-7W	7200	DeerLodge	4.4	10.0	7.4	1.3	3.3	2.0				
Elkhorn Hot Spgs.	Wise River	"	8mi.N.Polaris	15-4S-12W	8450	BeaverHead	14.2	--	9.6	4.6	--	2.4				
31 Storm Lake	Seymour Cr.	"	15mi.W.Anaconda	19-4N-13W	8100	DeerLodge	30.4	34.9	34.9	9.6	12.9	9.4				
			Average for Drainage		24.6	26.6	22.9	9.0	10.2	7.6	10.2	7.6				
MADISON RIVER																
2 Aster Creek*	Firehole R.	Wyo.	Lewis Lake	44-3N110-6W	7700	Yel.Nat.P.	78.0	89.0	64.2	33.8	37.2	27.6				
8 Lewis L.Divide*	"	"	3mi.S.Lewis L.	44-2N110-7W	"	"	"	"	"	"	"	"				
11 Norris Basin	Gibbon River	Idaho	Norris Basin	14-3N110-7W	7500	Targhee	--	--	--	--	--	--				
3 Big Springs*	South Fork	Mont.	Big Springs	34-14N-44E	6500	Gallatin	6.0	1.1	1.6	2.3	0.4	0.6				
16 West Yellowstone	South Fork	"	W.Yellowstone	34-13S-5E	6700	Gallatin	19.5	13.8	12.3	8.3	5.8	4.6				
Twenty-one Mile*	Greyling Cr.	"	8mi.S.Gallatin	1-11S-5E	7150	Gallatin	6.4	2.9	0.0	2.6	1.3	0.0				
Hebgen Dam	Cabin Creek	"	Hobgen Dam	22-11S-3E	6550	Targhee	--	--	--	--	--	--				
Valley View	Denny Cr.	Idaho	5mi.E.Henry's L.	7-15N-44E	6500	Average for Drainage	31.2	29.4	25.4	13.3	12.6	10.3				
GALLATIN RIVER																
Devil's Slide	Hyalite Cr.	Mont.	20mi.S.Bozeman	14-5S-6E	8100	Gallatin	52.8	62.0	46.1	18.8	23.4	14.8				
Hood Meadow	"	"	14mi." "	22-4S-6E	6600	"	7.5	12.0	0.0	2.6	5.0	0.0				
Hood Meadow Extn.	"	"	14mi." "	22-4S-6E	6600	"	9.4	14.0	7.6	2.9	5.2	2.2				
Mystic Lake No.1	Bozeman Cr.	"	12mi.SE.	"	6600	"	--	--	--	--	--	--				
Mystic Lake No.2	"	"	"	31-3S-7E	6600	"	--	--	--	--	--	--				
Twenty-One Mile	Gallatin River	"	8mi.S.Gallatin	1-11S-5E	7150	Yel.Nat.P.	19.5	13.8	12.3	8.3	5.8	4.6				
Ross Peak	Ross Cr.	"	12mi.N.Bozeman	10-1N-6E	7000	Gallatin	--	--	--	--	--	--				
New World Trail	Gallatin River	"	8mi.SE.	13-3S-6E	7000	Average for Drainage	22.3	25.4	16.5	8.2	9.9	5.4				

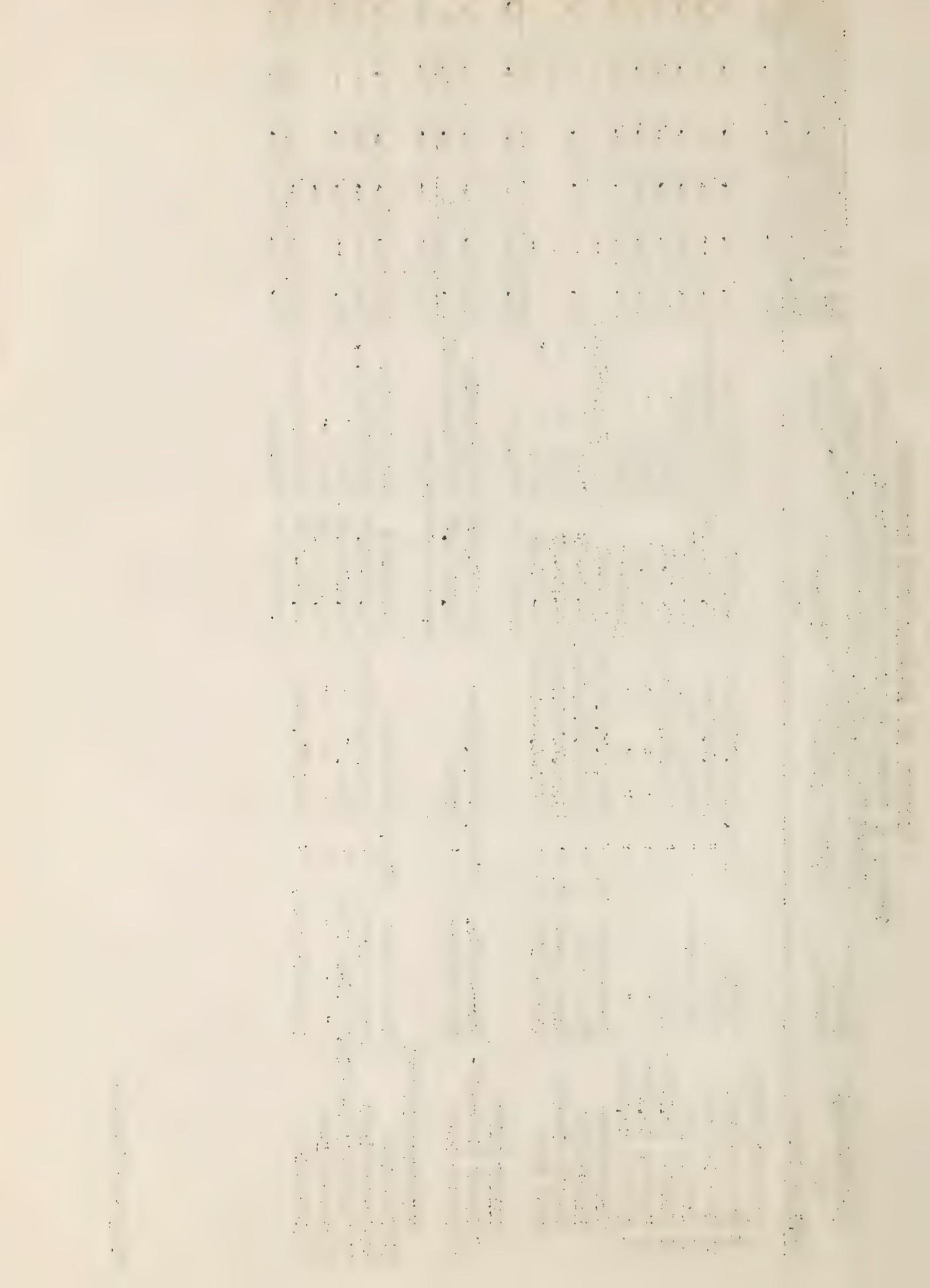
*On adjacent drainage
†Readings March 15



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Main Drainage and Snow Course No.	Local Drainage	Location		Elev. Forest	National Forest	May 1 Snow Course Measurements			
		State	Locality			Description	Avg.	1940	1941
In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
MISSOURI RIVER									
6 Chessman Res.	Tennile	Mont.	11 mi. SW Helena	6200	Helena	3•1	2•0	1•1	0•6
11 Goat Mountain	South Fork	"	47•5 N 12•9 W	7000	Lewis & Clark	7•7	--	0•4	--
36 Temple Pass	Canyon Creek	"	16-13N-7W	6900	Helena	11•6	15•8	5•8	5•2
41 Tennile Cr. Lower	Tennile	"	13-8N-6W	6250	"	3•8	4•8	2•6	1•0
42 Tennile Cr. Middle	"	"	13-8N-6W	6800	"	16•5	20•8	14•8	1•5
43 Tennile Cr. Upper	"	"	19-8N-5W	8000	"	26•1	29•2	24•8	5•4
Grasshopper	Grasshopper Cr.	"	6 mi. S. W. S. Spgs.	7000	Lewis & Clark	--	--	8•9	11•5
King's Hill	Belt Creek	"	19-9N-8E	"	"	30•1	--	--	--
Orville Harris	Musselshell R.	"	35-13N-7E	7950	"	--	27•4	10•3	--
Half Moon	Judith River	"	12 mi. E. W. S. Spgs.	6500	"	--	--	--	--
MARIAS RIVER			31-10N-9E	6000	"	--	--	--	--
7 Desert Mountain*	Cutbank Cr.	Mont.	22-12N-18E	Average for	Drainage	12•2	14•5	9•8	4•0
20 Marias Pass	Two Medicine	"	24-31N-19W	5600	Flathead	18•3	22•0	0•0	7•8
			48-31N-13-14W	5250	Glacier M.P.	11•9	10•8	15•1	4•7
				Average for	Drainage	15•1	16•4	0•0	6•8
YELLOWSTONE RIVER									
14 Dome Lake	Goose Creek	Wyo.	11-53N-87W	8800	Big Horn	33•2	26•5	39•8	13•2
40 Lupine Creek	Lupine Creek	"	44-9 N 110-6 W	7300	Yellow Nat. P.	11•0	--	6•5	4•0
41 Blacktail Deer Cr.	Blacktail Deer	"	44-9 N 110-6 W	7500	"	20•1	--	14•9	7•2
42 Beaver Dams	"	"	44-9 N 110-6 W	7200	"	"	--	0•0	--
70 Lodge Pole Cr.	Lodge Pole Cr.	"	32-56N-106W	8200	Shoshone	19•4	22•0	28•2	6•3
				Average for	Drainage	26•3	24•2	34•0	9•8
									10•7

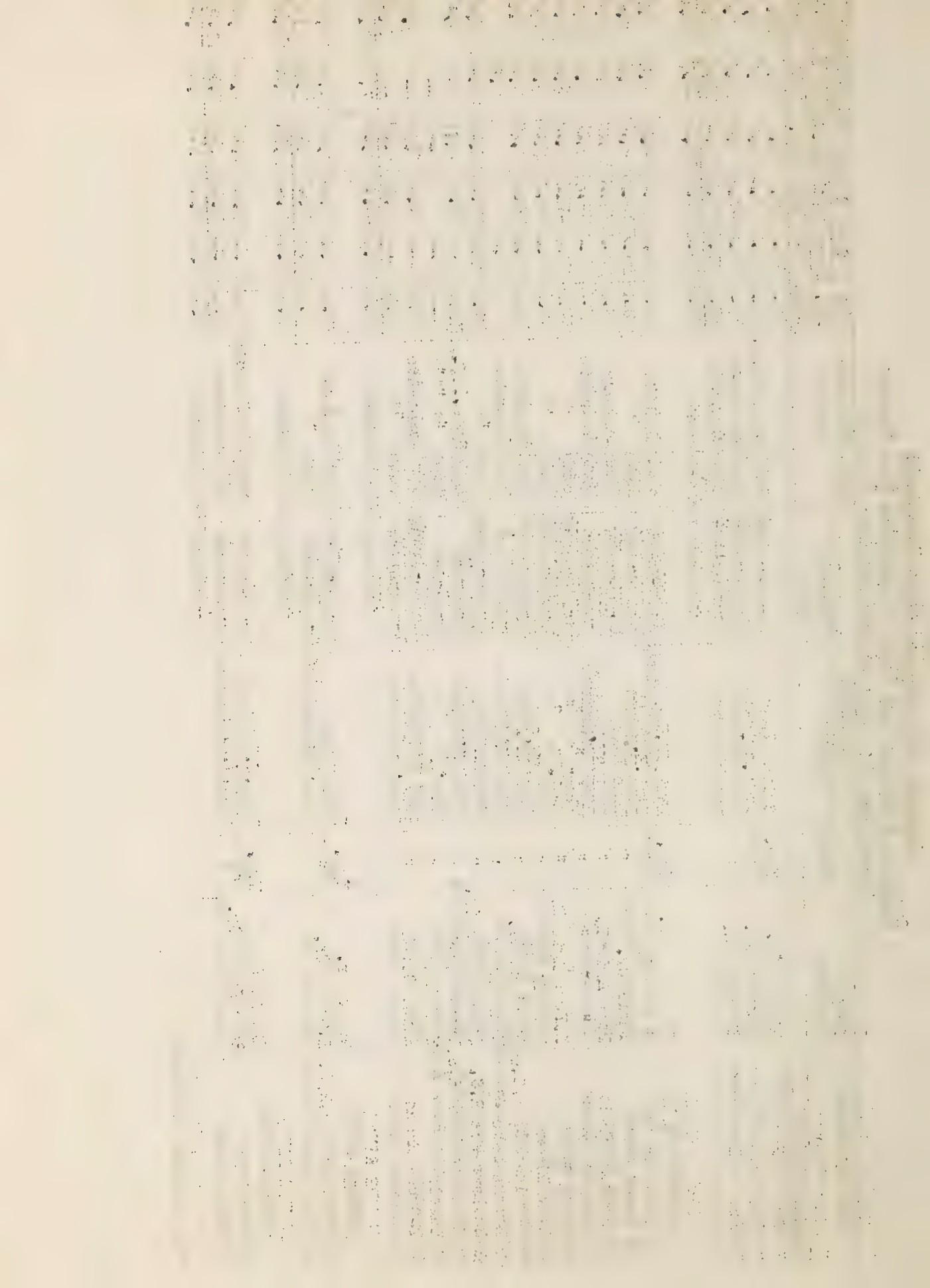
*Adjacent Drainage



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Main Drainage and No. Snow Course	Local Drainage	State	Locality	Location	Description	Snow Course Measurements					
						Elev.	National Forest	May 1	Av. Snow Depth	Av. Water Content	
Avg.	In.	In.	In.	In.	In.	Avg.	In.	In.	In.	In.	In.
SHOSHONE RIVER	Middle Cr.	Wyo.	Sylvan Pass	12-52N-110W	7100 Yel. Nat. F.	19.8	19.1	8.4	6.9	7.7	2.9
32 Sylven Pass	Hardpan Cr.	"	27mi. SW. Cody	25-51N-106W	9500 Shoshone	37.6	32.4	47.5	9.4	10.8	7.8
33 Up. Hardpan Basin	Shoshone R.	"	Brooks Lake	23-44N-110W	9200 Washakie	53.2	50.9	21.4	19.5	19.5	19.6
50 Brooks Lake #3*			Average for Drainage		36.9	34.1	37.8	12.6	12.7	12.7	10.1
BIGHORN RIVER	Tensleep Cr.	Wyo.	15mi. NE. Tensleep	30-49N-86W	8300 Bighorn	12.2	16.2	13.5	4.6	8.9	6.1
13 Tensleep R.S.	Ranger Creek	"	14mi. E. Shell	32-53N-88W	8800 Bighorn	20.6	19.7	18.8	6.6	6.6	5.6
16 Range Creek	Dome Lake	"	Dome Lake	11-53N-87W	8800 Bighorn	33.2	26.5	39.8	13.2	13.8	12.6
14 Dome Lake*	Sawmill Glade	"	13mi. SW. Lander	3-31N-101W	8500 Washakie	18.6	2.8	34.5	6.1	1.3	10.9
45 Sawmill Glade	Blue Ridge	"	15mi. " "	23-31N-101W	"	31.5	15.7	47.3	9.9	6.0	13.8
46 Blue Ridge	South Pass	"	19mi. " "	13-30N-101W	9500 "	33.4	20.2	46.7	10.4	6.8	14.0
47 South Pass	Wood River	"	42mi. SW. Cody	28-46N-103W	8000 Shoshone	10.8	2.5	19.2	2.8	0.6	5.1
48 Wood River	Sheridan Cr.	"	16mi. NW. Dubois	3-42N-109W	7500 Washakie	0.0				0.0	
49 Sheridan Cr. R.S. #2	Brooks Lake #3	"	Brooks Lake	23-44N-110W	9200 "	53.2	50.9	57.6	21.4	19.5	19.6
50 Brooks Lake #3	Wind River	"	27mi. NW. Lander	26-1N-4W	9000 Shos. I.R.	30.2	--	30.2	9.7	--	9.7
51 St. Lawrence R.S.	St. Lawrence Cr.	"	18mi. " "	23-28-3W	" "	--	--	--	23.5	6.8	--
52 Mosquito Park R.S.	Trout Creek	"	9mi. NW. Dubois	27-42N-108W	9500 Washakie	23.5	--	5.0	1.4	--	6.8
53 DuNoir	Wind River	"	12mi. N. Dubois	1-43N-107W	8000 "	5.0	--	26.7	19.3	9.4	1.4
54 T-Cross Ranch	Horse Creek		Average for Drainage							7.9	11.0
TONGUE RIVER	Dome Lake	Wyo.	Dome Lake	11-53N-87W	8800 Bighorn	33.2	26.5	39.8	13.2	13.8	12.6
14 Dome Lake	Goose Cr.	"	20mi. SW. Sheridan	4-53N-86W	7700 for Drainage	7.6	14.0	21.0	2.7	5.1	7.3
17 Big Goose Cr. R.S.	E. Goose Cr.		Average for Drainage			20.4	20.2	30.4	8.0	9.4	10.0
POWDER RIVER	Middle Fork	Wyo.	23mi. W. Kaycee	18-43N-85W	7500 Off Forest	13.6	11.7	22.5	4.1	3.5	6.9
30 Red Fork	Sour Dough Cr.	"	10mi. W. Klondike	17-49N-84W	8500 Bighorn	19.1	18.4	29.9	5.1	5.1	10.2
31 Sour Dough			Average for Drainage			16.4	15.0	26.2	4.6	4.3	8.6

*On adjacent drainage



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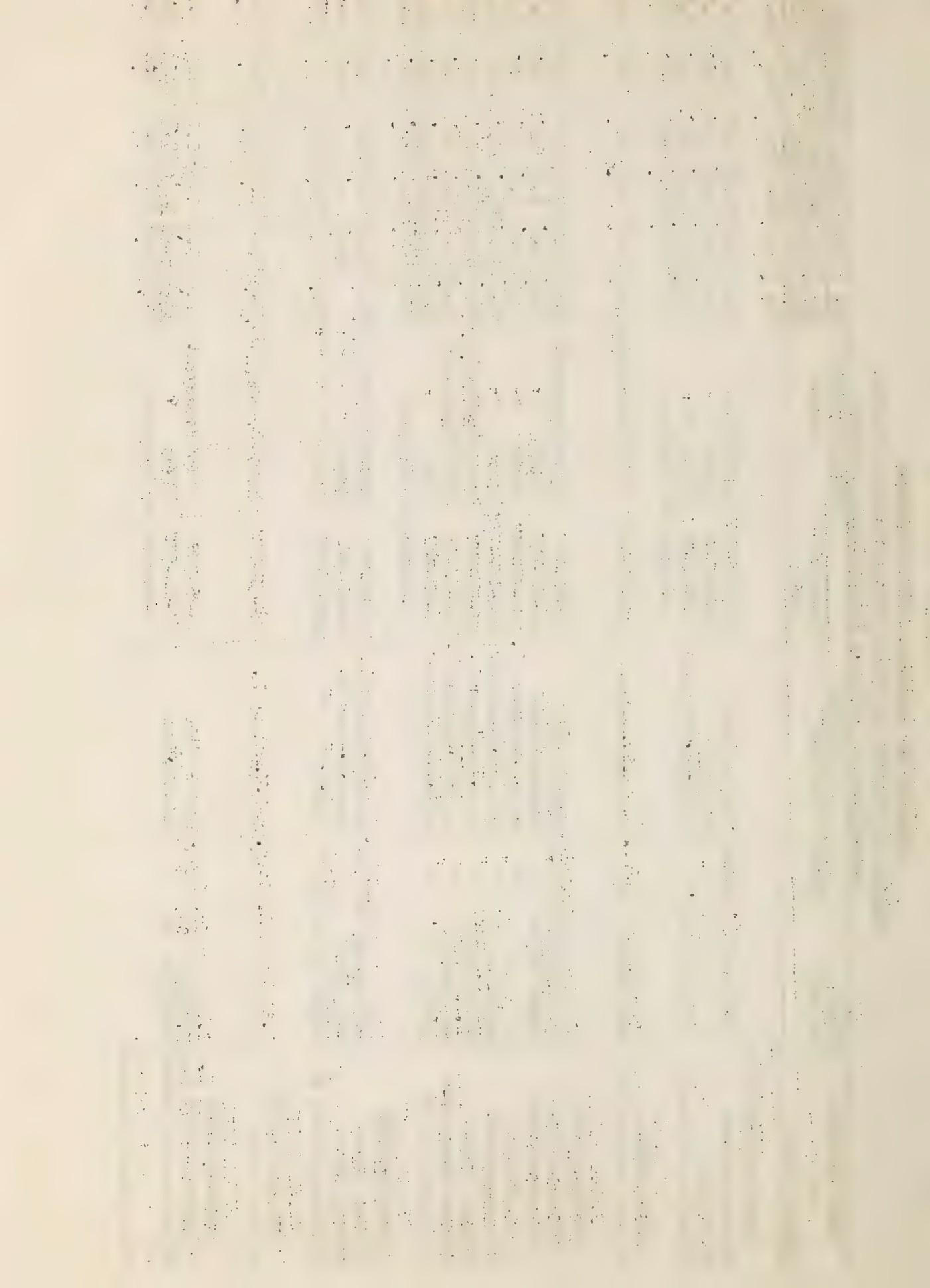
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							Av. Snow Depth			Av. Water Content			
							1940	1941	Avg.	In.	In.	In.	
1 Cameron Pass	Michigan Cr.	Cameron Pass	Colo.	2-6N-76W	10300	Roosevelt	64.2	63.2	25.0	22.4	22.3		
7 Park View	Illinoian Cr.	" 7 mi. SE. Rand	"	24-5N-78W	9200	Routt	19.6	20.4	27.7	8.0	5.8	13.5	
8 Columbine Lodge	Grizzly Cr.	Rbt. Ears Pass	"	21-5N-82W	9300	"	44.6	40.9	48.1	19.7	18.2	18.0	
51 Big Creek Lake	Big Creek	5 mi. SW. Pearl	"	9-11N-82W	9000	"	16.5	8.8	25.4	5.4	2.3	8.2	
62 Willow Creek P.*	Illinoian Cr.	Willow Cr. Pass	"	1-4N-78W	9500	Arapaho	37.4	33.3	41.6	15.2	10.6	16.9	
7 Bottle Creek	Encampmt Cr.	7 mi. SW. Encampmt	Wyo.	24-14N-85W	8200	MedicineBow	22.6	13.8	21.8	9.0	4.3	8.1	
8 Webber Spring	"	10 mi. W.	"	27-14N-85W	9000	"	47.2	37.0	42.0	19.2	12.3	15.3	
9 Old Battle	"	" 12 mi. W.	"	29-14N-85W	9800	"	79.6	65.8	83.1	33.0	26.9	29.7	
37 North French Cr.	N. French Cr.	Cent/Saratoga	"	27-16N-80W	10200	"	84.0	86.4	89.4	34.7	35.2	31.9	
38 N. Barrett Cr.#2	Barrett Cr.	"	"	30-16N-80W	9400	"	58.8	65.2	67.3	22.9	25.4	24.6	
39 Ryan Park #2	"	"	"	34-16N-51W	8400	"	20.1	23.1	31.9	7.5	9.9	12.1	
SWEETWATER RIVER							Average for Drainage	45.0	49.2	18.2	15.8	18.2	
29 Grannier Meadows	Rock Creek	20 mi. SW. Lander	Wyo.	19-30N-100W	9000	Washakie	31.8	19.3	50.8	11.2	7.6	16.6	
47 South Pass*	"	19 mi. "	"	13-30N-101W	9000	"	33.4	20.2	46.7	10.4	6.8	14.0	
LARAMIE RIVER							Average for Drainage	32.6	19.8	48.8	10.8	7.2	15.3
3 Brooklyn Lake	Nash Fork	7 mi. NW. Centennial	Wyo.	11-16N-79W	10200	MedicineBow	53.6	42.8	60.2	22.8	16.5	21.8	
11 Fox Park	Fox Creek	Fox Park	"	21-13N-78W	9200	"	18.7	11.9	28.6	7.7	4.2	10.2	
34 Pole Mountain#2*	Soldier Cr.	10 mi. SE. Laramee	"	35-15N-72W	8700	"	2.8	0.0	8.6	0.9	0.0	2.6	
35 Libby Lodge #2	Libby Creek	3 mi. NW. Cn tential	"	29-16N-78W	8700	"	8.5	6.7	17.2	2.8	2.4	4.9	
36 Hairpin Turn#2	Nash Fork	5 mi. NW.	"	24-16N-79W	9500	"	28.8	21.6	31.3	10.2	6.7	10.0	
4 W.Port-G-P.Tunnel	Laramie R.	4 mi. N. Chambers L.	Colo.	7-8N-75W	8600	Roosevelt	12.5	7.8	10.2	4.3	3.5	3.0	
50 Deadman Hill*	Deadman Cr.	10 mi. W.R. Feather	"	26-10N-75W	10200	"	46.0	32.4	46.2	15.6	12.3	14.2	
71 Deadman Hill#2*	Deadman Cr.	8 mi. SW."	"	6-9N-74W	10200	"	37.6	24.1	39.4	12.5	8.9	11.6	
88 Roach	Lagarde Cr.	8 mi. NW. Glendevey	"	5-10N-77W	9800	"	55.4	50.7	60.0	21.0	20.9	21.1	
Average for Drainage							29.3	22.0	33.5	10.9	8.4	11.0	

*On adjacent drainage

MISSOURI AND ARKANSAS RIVER WATERSHEDS
 Summary of Federal and State Cooperative Snow Surveys
 Issued May 10, 1941, at Fort Collins, Colorado

Main Drainage and Snow Course No.	Local Drainage	Location		Descrip-tion	Elev.	National Forest	May 1 Snow Course Measurements	
		State	Locality				Avg.	Av. Water Content
					In.	In.	In.	In.
SOUTH PLATTE RIVER								
14 Hoosier Pass	S. Platte R. " " "	Colo.	Hoosier Pass	13-8S-78W	11400	Pike	30.1	12.3
15 Fairplay		"	Fairplay	33-9S-77W	10000	"	0.0	0.0
83 Jefferson Cr. #2	Jefferson Cr.	"	5mi. N.W. Jefferson	14-7S-76W	10100	"	8.2	7.0
CROW CREEK				Average for Drainage	12.8	10.2	22.0	6.4
34 Pole Mountain #2	Crow Creek	Wyo.	10mi. SE. Laramie	35-15N-72W	8700	Medicine Bow	0.0	2.6
POUDRE RIVER								
1 Cameron Pass	Joe Wright Cr. Colo.		Cameron Pass	2-6N-76W	10300	Roosevelt	64.2	22.3
2 Chambers Lake	Poudre River	"	Chambers Lake	6-7N-75W	9000	"	8.4	3.4
3 Big South	"	"	2mi. E. Chambers L.	33-8N-75W	8600	"	0.2	0.3
50 Deadman Hill	No. Poudre R.	"	10mi. W.R. Feather	26-10N-75W	10200	"	46.0	14.2
65 Lake Irene*	Big S. Poudre	"	1mi. SW. Milner P.	8-5N-75W	10600	Ry. Mtn. N.P.	66.2	12.5
68 Hour Glass Lake	L.S. Poudre	"	2mi. NW. Pingree P.	18-7N-73W	9500	Roosevelt	17.8	23.5
71 Deadman Hill #2	N. Poudre R.	"	8mi. SW. R. Feather	6-9N-74W	10200	"	37.6	6.7
BIG THOMPSON				Average for Drainage	34.3	28.3	12.5	11.6
65 Lake Irene*	Big Thompson R. Colo.		1mi. SW. Milner P.	8-5N-75W	10600	Ry. Mtn. N.P.	66.2	11.7
67 Fall River	Fall River	"	12mi. W. Estes P.	6-5N-74W	10600	"	61.8	23.5
95 Hidden Valley #2	Hidden Valley Cr.	"	9mi. W. " "	23-5N-74W	10200	"	48.0	--
ST. VRAIN RIVER								
41 Wild Basin	N. St. Vrain R.	Colo.	5mi. W. Allens P.	24-3N-74W	10000	Ry. Mtn. N.P.	33.5	12.4
BOULDER CREEK								
5 E. Port. Moffat T.	S. Boulder Cr.	Colo.	East Portal	2-2S-74W	9400	Roosevelt	2.5	2.6
60 University Camp #2	N. Boulder Cr.	"	5mi. SW. Ward	28-1N-73W	10300	"	40.6	16.6
				Average for Drainage	27.0	24.2	28.8	9.6

*On adjacent drainage.



MISSOURI AND ARKANSAS RIVER WATERSHEDS
 Summary of Federal and State Cooperative Snow Surveys
 Issued May 10, 1941, at Fort Collins, Colorado

Main Drainage and No. Snow Course	Local Drainage	State	Locality	Location	Descrip-tion	Elev.	National Forest		May 1 Snow Course Measurements	
							Avg. In.	Snow Depth In.	Av. Water Content In.	1940 In.
CLEAR CREEK	Clear Creek	Colo.	10mi.W.Georgetown	27-4S-76W		10100	Arapaho	37.9	19.9	42.5
61 Loveland Pass #2								13.0	8.9	12.7
ARKANSAS RIVER										
19 Tennessee Pass	Tennessee Cr.	Colo.	Tennessee Pass	21-8S-80W		10200	Cochetopa	15.4	6.7	5.2
21 Twin Lakes Tun.	Lake Creek	"	9mi.W.Twin Lakes	22-11S-82W		10500	"	23.1	16.0	3.6
42 Marshall Creek*	Poncha Cr.	"	Marshall Pass	24-48N-6E		10800	"	27.8	18.2	10.1
43 Poncha Creek	"	"	"	19-48N-7E		10500	"	21.0	13.4	5.2
72 Whiskey Creek #2	Whiskey Cr.	"	Whiskey Cr.Pass	37-2N105.2W		10300	Maxwell Gr.	15.2	--	4.6
74 LaVeta Pass#2*	Cuchara Cr.	"	LaVeta Pass	22-28S-70W		9300	SanCristogr	8.0	--	44.9
78 Four Nile Park#2	Lake Creek	"	3mi.SW.Twin L.	23-11S-81W		9700	Cochetopa	1.2	0.0	7.1
79 Fremont Pass #2	E.Fork Ark.R.	"	Fremont Pass	2-8S-79W		11400	Arapaho	47.7	54.2	52.8
81 Blue Lakes #2	Cuchara Cr.	"	15mi.SW.LaVeta	30-31S-69W		10000	San Isabel	17.7	5.4	16.6
92 Monarch Pass	S.Fork Ark.R.	"	Monarch Pass	16-49N-6E		10500	Cochetopa	63.3	--	48.9
Average for Drainage										
						222.0		16.3	38.9	7.7
Average for Drainage										
13.0										

*On adjacent drainage

RESERVOIR STORAGE

Reservoir Storage in Thousands of Acre-feet, Colorado and Wyoming, as of May 1, for the years 1932 and 1941, inclusive. (Based on data gathered by State Engineer of Colorado, U. S. Bureau of Reclamation and other agencies)

A = Percentage of capacity. B = Percentage of 10-year average.

Reservoir	Capacity	1932			1933			1934			1935			1936			1937			1938			1939			1940			1941			10 yr Avg. P.			A			B		
		Ac-ft	Ac-ft	Ac-ft	Ac-ft	Ac-ft	Ac-ft	Ac-ft	Ac-ft																															
COLORADO																																								
Eleven Mile	81.9	---	---	---	4.8	16.4	27.4	66.8	70.5	81.9	144.9	100	182																											
Cheeseman	79.0	43.0	8.4	43.4	18.7	32.0	48.7	34.4	79.1	59.8	49.7	42.2	63	118																										
Marston	19.8	13.1	14.6	17.1	13.8	14.2	16.7	16.7	15.4	16.6	16.6	15.5	84	107																										
Barr	32.2	10.2	12.0	17.8	7.4	11.4	20.0	13.3	25.6	11.0	10.5	13.9	33	76																										
Milton	24.4	7.4	4.9	10.5	1.8	3.5	4.0	4.0	15.9	3.9	4.4	6.7	18	66																										
Standley	18.5	3.4	1.4	0.0	2.8	13.4	15.8	12.2	15.7	8.1	11.3	8.4	61	135																										
Marshall	10.3	1.3	1.8	3.1	0.1	4.1	6.0	6.0	6.2	1.6	5.4	3.6	52	150																										

pSome averages for shorter periods.

REVIEW OF THE LITERATURE

DISCUSSION

Using SPEL easier, yet not as smooth has shown to be a better choice. This is due to the fact that the system is more robust and less prone to errors.

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RESERVOIR STORAGE

Reservoir Storage in Thousands of Acre-Feet, Colorado and Wyoming, as of May 1, for the Years 1932 to 1941, inclusive. (Based on data gathered by State Engineer of Colorado, U. S. Bureau of Reclamation and other agencies.)

A = Percentage of capacity. B = Percentage of 10-year average.

Reservoir	Capacity	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	10-yr.Avg. ^b	A	B	
COLORADO, Cont.	Ac-ft	Ac-ft	Ac-ft	Ac-ft	Ac-ft	Ac-ft	Ac-ft	Ac-ft	Ac-ft	Ac-ft	Ac-ft	Ac-ft	%	%	
Riverside	57.5	41.8	12.8	46.7	12.7	44.1	47.0	30.7	54.6	21.0	30.5	34.2	53	89	
Empire	37.7	27.1	22.2	24.7	0.0	18.6	24.7	23.0	34.4	23.9	20.3	21.9	54	93	
Jackson Lake	35.4	33.5	33.2	33.4	31.7	31.2	33.4	33.2	34.1	33.4	33.7	33.1	95	102	
Previtt	32.8	21.8	9.8	23.2	4.2	12.0	19.2	9.7	28.6	7.3	6.8	14.3	21	48	
Point of Rocks	65.0	22.2	29.4	60.0	30.1	56.8	64.3	38.0	66.4	35.1	44.2	44.6	68	99	
Julesburg	28.2	22.6	20.3	21.9	22.8	22.0	20.9	22.9	21.5	22.4	23.1	22.0	82	105	
Loveland	14.3	0.8	0.0	2.1	0.7	3.0	1.0	1.0	1.0	1.0	0.2	1.2	2.2	8	
Mariano	5.4	3.0	3.1	3.3	0.4	3.0	2.9	7.5	3.1	12.6	2.6	8	50	97	
Union	12.7	3.0	0.6	4.1	0.0	2.9	7.5	3.1	12.6	2.6	2.7	2.7	2.8	6	
Windsor Res.	18.6	7.9	4.2	11.8	2.8	11.2	10.5	11.8	17.7	5.0	11.8	9.5	63	124	
Cache la Poudre	9.5	4.4	5.0	9.1	2.8	5.7	7.3	7.5	9.2	4.7	7.2	6.3	76	114	
Fossil Creek	11.6	4.3	6.1	11.2	2.9	8.1	7.1	5.5	11.7	3.7	5.6	6.6	48	85	
Terry	8.2	4.0	4.1	4.1	4.1	4.2	4.1	4.1	5.9	4.1	4.0	4.3	49	93	
Halligan	6.4	2.0	1.6	2.0	3.0	2.9	4.1	4.9	4.3	1.7	0	2.6	--	--	
Chambers Lake	8.8	2.0	2.3	4.0	0.7	2.8	2.4	3.1	7.3	2.2	3.3	3.0	38	110	
Twin Lakes	57.9	5.9	5.9	6.6	13.8	14.5	14.4	7.2	28.4	15.3	11.5	12.3	20	94	
Meredith	41.9	2.5	0.0	0.0	0.0	0.0	3.0*	0.0	24.3	0.0	0.0	3.0	--	--	
Horse Creek	26.9	0.0	4.3	0.0	0.0	0.0	7.9	0.0	8.3	0.0	0.0	2.0	--	--	
Adobe Creek	61.6	0.0	0.0	0.0	0.0	0.0	1.7	0.0	8.2	0.0	0.0	1.0	--	--	
Model	17.8	6.4	0.0	2.7	0.0	2.6	1.8	3.0	8.5	1.3	5.3	3.2	30	166	
WYOMING															
Pathfinder	1070.0	352.5	404.7	331.8	133.2	263.5	343.8	352.8	430.3	77.7	92.0	278.2	9	33	
Guernsey	71.6	50.0	63.8	37.6	24.8**	44.7**	37.5**	52.5**	42.0	47.1	50.3	45.0	70	112	
Seminole	1000.0							0	99.4	123.5	85.5	83.6	10	118	
Alcova	185.0								0	56.1	51.0	74.3	40	76	
Wheatland	90.0								317.1	394.3	106.9	17.7	24.7	20	72
Shoshone	456.6								430.6	620.8	492.7	277.1	8	13	
Jackson Lake	847.0	185.7	535.9	348.6	206.0	331.5	504.2	0	42.8	38.8	15.7	32.4	10	48	
Bull Lake	152.0								21.5	19.8	24.7	21.7	72	99	
Pilot Butte Lake	30.0														

^bSome averages for shorter periods

*Estimated

**Based on capacity 54,610 Acre-Feet

